University of Gdańsk

Subject card

Subject name and code	Microscopic techniques - labolatory classes, PG_00192683		
Field of study	Marine Biotechnology		
Date of commencement of studies	October 2027	Academic year of realisation of subject	2027/2028
Education level	Master's studies	Subject group	Obligatory subject group in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	English
Semester of study	2	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	UG Institute of Biotechnology -> Intercollegiate Faculty of Biotechnology UG-MUG -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Magdalena Weidner-Glunde	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	15.0	0.0	0.0	15

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	15	1.0	9.0	25

Subject objectives

The specific objective of the course is to familiarise students with the physical basis of microscope operation, the limitations of microscope applicability and the research capabilities of different types of microscopers.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[MBMU2-KU02] Can collect and interpret empirical data; applies statistical methods and computer tools in data analysis; formulates conclusions based on empirical data	The student knows the basis methods of quantitative and qualitative analysis of microscopic data and understands the importance of documentation of obserwation	[SU2] presentation/project/paper/ report
[MBMU2-KU01] Can plan and conduct research in the laboratory and at sea, and to document procedures and results. Independently or under the supervision of an authorized staff member, carries out work using specialized equipment. Complies with occupational health and safety regulations.	The student knows the theoretical basis of the operation of different types of microscopes (light, fluorescence, elektron) and their applications in biological research	[SU2] presentation/project/paper/ report

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<tr><td>Subject contents</td><td>

Auditory classes

1. Preparation, fixation and staining of specimens
2. Introduction to light microscopy
3. Contrast techniques in light microscopy
4. Fluorescence microscopy - operation and applications
5. Construction and operation of confocal microscopes
6. Stereoscopic microscopy
7. From whole organisms to single particles innovative imaging methods in confocal microscopy

Laboratory classes

1. Setting up Kohler illumination
2. Operation of a light microscope with a camera
3. nterpretation of the microscopic image. Taking measurements.
4. Sample preparation, fixation and staining
5. Fluorescence microscope image acquisition
6. Fluorescence microscopy data processing
7. Imaging with simple and stereoscopic light microscopes
8. Live imaging
9. Imaging in three-dimensional demonstration

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<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>presentation/project paper/report</td><td>51.0%</td><td>100.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Materials provided in class by the teacher</td></tr>
<tr><td>Supplementary literature</td><td>Materiały provided in class by the instructor.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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